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(54) **Process of treating carpets with a composition comprising a brightener**

(57) The present invention relates to a process of treating a carpet comprising the application of a liquid composition onto said carpet using a manually or

electrically operated spraying device wherein said composition comprises a brightener. The carpet treatment composition according to the present invention provides soil hiding benefits and/or carpet cleaning benefits.

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DescriptionTechnical Field

5 [0001] The present invention relates to a process of treating carpets using a liquid composition. More particularly, the present invention relates to a process of treating carpets whereby good overall carpet cleaning performance is achieved.

Background of the Invention

10 [0002] Carpets produced from synthetic or natural fibers and mixtures thereof are commonly used in residential and commercial applications as a floor covering. Various types of fibers can be used in making carpets such as polyamide fibers, polyester fibers as well as wool, cotton or even silk in the case of rugs.

15 [0003] However, carpets irrespective of whether they are made from natural or synthetic fibers are all prone to soiling and staining. Foods, grease, oils, beverages in particular such as coffee, tea and soft drinks especially those containing acidic dyes can cause unsightly, often dark stains on carpets. Also fibers may become soiled as a result of dirt particles, clay, dust, i.e., particulate soils in general, which may come into contact with and adhere to the fibers of the carpet. These latter soils often appear in the form of a diffuse layer of soils rather than in the form of spots and tend to accumulate particularly in the so called "high traffic areas" such as near doors as a result of intensive use of the carpets in such areas.

20 [0004] Compositions for cleaning carpets are already known in the art. For example carpet cleaning compositions having a pH of from 1 to 6 comprising a source of active oxygen as disclosed in EP-A-0 629 694.

25 [0005] However, it is well known from consumer research that the overall carpet cleaning performance of the carpet treatment compositions, in particular the stain removal performance on proteinic stains, greasy stains as well as particulate stains, especially in so called "high traffic areas" may still be further improved.

[0006] It is therefore an objective of the present invention to provide a process of treating a carpet with a liquid carpet treatment composition that delivers good overall carpet cleaning performance. In particular, it is an objective of the present invention to provide a process of treating a carpet with a liquid carpet treatment composition that delivers good overall stain removal performance on various types of stains including proteinic, greasy and/or particulate stains.

30 [0007] It has now been found that the above objectives can be met by a process of treating a carpet according to the present invention.

[0008] An advantage of the processes as described herein is that said processes provide an easy and fast way of treating a carpet.

35 [0009] A further advantage of the of the process as described herein is the perceived cleanliness of the carpet ("improved perceived cleanliness") provided by the improved cleaning performance ("carpet cleaning benefit") of the carpet treatment composition herein and the soil-hiding benefit provided by the carpet treatment composition herein.

40 [0010] Still a further advantage of the present invention is that the process of treating a carpet herein is applicable to all carpet types, especially delicate natural fibers, and are also safe to all carpet dye types, particularly sensitive natural dyes used therein. The present invention is also suitable to be used to treat upholstery and car seats covering.

Background art

45 [0011] The following documents are representative of the prior art available on carpet treatment compositions.

[0012] EP-A-0 629 694 discloses a carpet cleaning composition having a pH of from 1 to 6 comprising a source of active oxygen.

[0013] US 4,490,270 discloses an aqueous solution composition for use in carpet cleaning essentially comprising a surfactant, monopotassium phosphate, gluteraldehyde, a solvent and an optical brightener.

50 Summary of the Invention

[0014] The present invention encompasses a process of treating a carpet comprising the application of a liquid composition onto said carpet using a manually or electrically operated spraying device wherein said composition comprises a brightener, with the proviso that said spraying device is not a pressurized device.

55 [0015] In a preferred embodiment said composition further comprises a peroxygen bleach.

[0016] In another preferred embodiment said composition is applied onto said carpet using an electrically operated spraying device.

[0017] The present invention also encompasses the use of a brightener in a carpet treatment composition to treat carpets whereby said carpet treatment composition provides soil-hiding benefits and/or carpet cleaning benefits.

Detailed Description of the Invention

Process of treating a carpet

[0018] The present invention encompasses a process of treating a carpet comprising the application of a liquid composition onto said carpet using a manually or electrically operated spraying device wherein said composition comprises a brightener.

[0019] In a highly preferred embodiment of the present invention said composition is applied onto said carpet using an electrically operated spraying device.

[0020] In a preferred embodiment of the present application, said process comprises the steps of applying said composition onto the surface of the carpet and leaving said composition to substantially dry on the carpet. More preferably, said process of treating a carpet further comprises the step of at least partially removing said composition. Even more preferably, said process of treating a carpet further comprises the step of at least partially removing said composition in combination with soil particles.

[0021] In another embodiment of the present application, said process comprises the steps of applying said composition to parts, preferably heavily soiled parts of the carpet, e.g., high traffic areas, or spot stains, mechanically agitating the composition, preferably with an implement, into the soiled parts of the carpet layer and leaving said composition to substantially dry on the carpet. More preferably said process of treating a carpet further comprises the step of at least partially removing said composition, even more preferably said process of treating a carpet further comprises the step of at least partially removing said composition in combination with soil particles. Any number of implements may be used to provide said mechanical agitation, including brushes, sponges, paper towels, a cleaning glove, a human finger and the like. In a preferred embodiment said implement is attached and/or attachable to the spraying device used in the process of the present invention. Said mechanical agitation allows the liquid composition to better penetrate into the carpet fibers and thus improves the chemical cleaning action of said composition. In addition, said contact loosens the dirt particles forming the stain.

[0022] In the process according to the present invention, the composition is applied onto the carpet using a manually or electrically operated spraying device. Said spraying device is preferably a container that has at least one aperture through which the composition is dispensed to produce a spray of droplets.

[0023] Such a manually or electrically operated spraying device may comprises a means for delivering the composition by a pump ("pump spray dispenser"). Electrically operated pump spray dispensers are particularly preferable if a large area is to be treated and/or if a high amount of product has to be applied onto a heavily stained area ("spot") of the carpet as they facilitate the ease of use by the consumer. Said electrically operated pump spray dispensers ensure uniform coverage of the area to be treated.

[0024] Preferred manually or electrically operated spraying devices herein are manually or electrically operated pump spray dispensers. More preferred spraying devices herein are electrically operated pump spray dispensers.

[0025] Spraying devices operated by any source of pressurised gas ("pressurised devices") such as an aerosol-can, a pressurizer or a carbonater are not suitable for use herein. Indeed, it has been found that in some instances in a pressurised device the ingredients of the compositions stored therein are not sufficiently stable due to the elevated pressure conditions in said devices and/or during the application of said composition onto a carpet.

[0026] Typical manually operated pump spray dispensers include push button operated or trigger operated pump spray dispenser.

[0027] A preferred electrically operated pump spray dispensers ("electrical spraying device") herein is a container wherein the means for delivering the composition comprises an electrically driven pump and a spray arm. Said spray arm is preferably either elongated or extendible and has at least one aperture so that in operation, the composition is pumped by said electrically driven pump from the container, through the spray arm to the aperture from which it is dispensed. It is preferred that the spray arm communicates with the container by means of a flexible connector. The spray arm may have at least one aperture located along its length. The spray arm allows the user to exert control over the trajectory of the sprayed composition, thereby increasing the accuracy with which the composition is applied. The electrically driven pump may be, for example, a gear pump, an impeller pump, a piston pump, a screw pump, a peristaltic pump, a diaphragm pump, or any other miniature pump. In a highly preferred embodiment the electrically driven pump for use herein is a gear pump with a typical speed between 6000 rpm and 12000 rpm. The electrically driven pump is driven by any means which typically produces a torque of between 1 and 20 mN·m such as an electric motor. The electric motor must in turn be provided with a power source. The power source may be either mains electricity (optionally via transformer), or it may be a throw-away battery or rechargeable battery. The spray arm may be rigidly elongated. However such a spray arm can be difficult to store, and the spray

arm is preferably extendible either by means of telescopic or foldable configuration.

[0028] In a highly preferred embodiment, the composition is applied onto the carpet in the form of a spray of droplets having a particle size distribution with a mean diameter $D(v,0.9)$ of less than 1500 microns, preferably less than 1000 microns, more preferably of less than 750 microns, even more preferably less than 500 microns, and most preferably from 350 microns to 10 microns.

[0029] By "mean diameter $D(v,0.9)$ of less than 1500 microns" for a droplet size distribution it is meant that 90% of the spray of droplets dispensed (expressed in volume unit) has a droplet diameter of less than 1500 microns. For instance, a $D(v,0.9)$ of less than 1500 microns indicates that 90% of the total sprayed volume is dispensed with droplets whose diameter is less than 1500 microns.

[0030] The particle size distribution of a spray of droplets can be determined by using any suitable test procedure, as for example, described in WO 99/53005 and WO 99/53006.

[0031] Any container adapted to deliver a spray of droplets as defined herein is suitable for use herein. Several modifications can be made to the conventional, single aperture, spray head to ensure that a spray of such droplets as are required herein are formed.

[0032] The amount of the composition required for the treating of carpets according to the present invention will depend on the severity of the stain or soil. In the case of stubborn stains, more than one application may be required to ensure complete removal of the stain.

[0033] The area to be treated by applying the compositions according to the present invention may be of any size. Indeed, localized spots, parts of the carpets, as e.g., soiled high traffic areas and/or the whole carpet may be treated with the composition for treatment of a carpet according to the present invention.

[0034] In a preferred embodiment, the composition applied to the carpet is left to substantially dry. Typically, the composition is left to dry on the carpet for less than 2 hours, preferably less than 1 hour, more preferably less than 40 minutes, even more preferably from 1 to 30 minutes and most preferably from 1 to 20 minutes.

[0035] Preferably the step of leaving the composition to dry onto the carpet (drying step) can either be an "active drying step" or a "passive drying step". By "active drying step" it is meant herein, performing an additional action to facilitate the evaporation of the volatile ingredients of the liquid composition as disclosed herein, preferably by heating the carpet and/or the liquid composition applied thereon, preferably heating by means of application of hot air, infrared radiation and the like. By "passive drying step" it is meant herein, evaporation of the volatile ingredients of the liquid composition as disclosed herein without performing further action.

[0036] By "substantially dry" it is meant herein the stage where at least 40%, preferably at least 60% of the initial amount of composition dispensed onto the carpet is lost due to evaporation.

[0037] The step of leaving the composition to dry on the carpet is of course performed under "normal temperature" and "normal humidity conditions". By "normal temperature conditions" it is meant herein, from 15° C to 25° C, preferably from 20° C to 25° C. By "normal humidity conditions" it is meant herein, from 40 %RH (%-relative humidity) to 80 %RH, preferably from 50 %RH to 65 %RH.

[0038] Indeed, said composition may be left to substantially dry until said composition combined with dirt forms substantially dry residues. Preferably, said composition, more preferably said substantially dry residues, are then removed from the carpet. Even more preferably said substantially dry residues are removed mechanically, as e.g., by brushing, sweeping beating, and/or by vacuum cleaning. This may be carried out with the help of any commercially available vacuum cleaner like for instance a standard Hoover® 1300W vacuuming machine.

[0039] According to the present invention the compositions herein may be used for the removal of stains and soils as well as of odors from carpets or hard wearing textiles and fabrics, e.g., upholstery. In addition the compositions according to the present invention may be used to hygienise, disinfect and/or exterminate microinsects from carpets or hard wearing textiles and fabrics, e.g., upholstery, rugs, curtains.

The composition

[0040] The compositions of the present invention are formulated as liquid compositions. Preferred compositions herein are aqueous compositions and therefore, preferably comprise water, more preferably in an amount of from 60% to 98%, even more preferably of from 80% to 97% and most preferably 85% to 97% by weight of the total composition.

[0041] The pH of the liquid compositions according to the present invention may typically be from 1 to 14. Preferably, the pH of the liquid compositions herein, as is measured at 25°C, is at least, with increasing preference in the order given, 0.1, 0.5, 1, 1.5, 2, 2.5, 3, 3.5, 4, 4.5, 5, 5.5, 6 or 6.5. Independently, the pH of the liquid compositions herein, as is measured at 25°C, preferably is no more than, with increasing preference in the order given, 14, 13.5, 13, 12.5, 12, 11.5, 11, 10.5, 10, 9.5, 9, 8.5, 8, 7.5 or 7. Accordingly, the compositions herein may further comprise an acid or base to adjust pH as appropriate.

[0042] In a preferred embodiment wherein the compositions herein comprise a peroxygen bleach, the pH of the liquid compositions, as is measured at 25°C, is typically at least, with increasing preference in the order given, 0.1,

0.5, 1, 1.5, 2, 2.5, 3, 3.5, 4 or 4.5. Independently, the pH of said preferred liquid compositions comprising a peroxygen bleach as described herein, as is measured at 25°C, preferably is typically no more than, with increasing preference in the order given, 10, 9.5, 9, 8.5, 8, 7.5, 7, 6.5, 6 or 5.5. These preferred pH ranges contribute to the stability of hydrogen peroxide, when present.

[0043] Preferred acids herein are organic or inorganic acids or mixtures thereof. Preferred organic acids are acetic acid, or citric acid or a mixture thereof. Preferred inorganic acids are sulfuric acid or phosphoric acid or a mixture thereof. A particularly preferred acid to be used herein is an inorganic acid and most preferred is sulfuric acid.

[0044] Typical levels of such acids, when present, are of from 0.01% to 1.0% by weight, preferably from 0.05% to 0.8% and more preferably from 0.1% to 0.5% by weight of the total composition.

[0045] The bases to be used herein can be organic or inorganic bases. Suitable bases for use herein are the caustic alkalis, such as sodium hydroxide, potassium hydroxide and/or lithium hydroxide, and/or the alkali metal oxides such, as sodium and/or potassium oxide or mixtures thereof. A preferred base is a caustic alkali, more preferably sodium hydroxide and/or potassium hydroxide.

[0046] Other suitable bases include ammonia, ammonium carbonate and hydrogen carbonate.

[0047] Typical levels of such bases, when present, are of from 0.01% to 1.0% by weight, preferably from 0.05% to 0.8% and more preferably from 0.1% to 0.5% by weight of the total composition.

Brightener

[0048] As an essential ingredient the liquid compositions according to the present invention comprise a brightener. Any brighteners known to those skilled in the art may be used herein including both hydrophobic and hydrophilic brighteners and mixtures thereof.

[0049] Brighteners are compounds which have the ability to fluoresce by absorbing ultraviolet wave-lengths of light and re-emitting visible light. Brighteners, also referred to as fluorescent whitening agents (FWA), have been extensively described in the art, see for instance EP-A-0 265 041, EP-A-0 322 564, EP-A-0 317 979 or "Fluorescent whitening agents" by A.K. Sarkar, published by MERROW, especially page 71-72.

[0050] Suitable commercially available brighteners can be classified into subgroups, which include, but are not necessarily limited to, derivatives of stilbene, pyrazoline, coumarin, carboxylic acid, methinecyanine, dibenzothiophene-5,5-dioxide, azole, 5- and 6-membered-ring heterocycle, and other miscellaneous agents. Examples of such brighteners are disclosed in "The Production and Application of Fluorescent Brightening Agents", M. Zahradnik, Published by John Wiley & Sons, New York (1982). Further optical brighteners which may also be used in the present invention include naphthlimide, benzoxazole, benzofuran, benzimidazole and any mixtures thereof. Particularly preferred brighteners for use herein are the derivatives of stilbene and mixtures thereof.

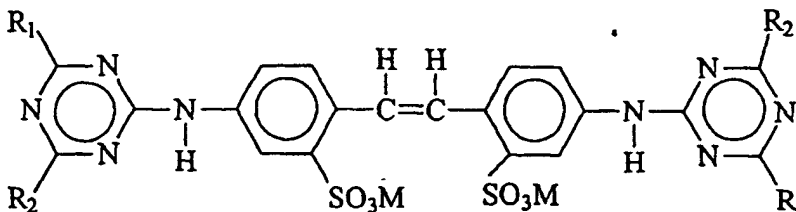
[0051] Examples of suitable brighteners are those identified in U.S. Patent 4,790,856. These brighteners include the PHORWHITE® series of brighteners from Verona. Other brighteners disclosed in this reference include: Tinopal-UNPA®, Tinopal CBS-X® and Tinopal 5BM® available from Ciba Specialty Chemicals; Artic White CC® and Artic White CWD®; the 2-(4-styryl-phenyl)-2H-naphtho[1,2-d]triazoles; 4,4'-bis(1,2,3-triazol-2-yl)-stilbenes; 4,4'-bis(styryl) bisphenyls; and the aminocoumarins.

[0052] Specific examples of brighteners useful herein include 4-methyl-7-diethylamino coumarin; 1,2-bis-(benzimidazol-2-yl)ethylene; 1,3-diphenyl-pyrazolines; 2,5-bis(benzoxazol-2-yl)thiophene; 2-styryl-naphtho-[1,2-d]oxazole; 2-(stilbene-4-yl)-2H-naphtho[1,2-d]triazole, 3-phenyl-7-(isoindolyl) coumarin; 3-methyl-7-(isoindolyl) coumarin; 3-chloro-7-(isoindolyl) coumarin; 4-(isoindolyl)-4'-methylstilbene; 4-(isoindolyl)-4'-methoxystilbene; sodium 4-(isoindolyl)-4'-stilbenesulfonate; 4-(isoindolyl)-4'-phenylstilbene; 4-(isoindolyl)-3-methoxy-4'-methylstilbene; 4-(2-chloroisoindolyl)-4'-(2-methylisoindolyl)-2,2'-stilbenedisulfonic acid; disodium 4,4'-diisoindolyl-2,2'-stilbene disulfonate; 4,4'-diisoindolyl-2,2'-stilbenedisulfonamide; disodium 4,4'-(7,8-dichloro-1-isoindolyl)2,2'-stilbenedisulfonate; disodium 4,4'-(7-chloro-1-isoindolyl)2,2'-stilbenedisulfonate; disodium 4,4'-(6-isopropoxy-1-isoindolyl)2,2'-stilbenedisulfonate; disodium 4,4'-(7,8-diisopropyl-1-isoindolyl)2,2'-stilbenedisulfonate; disodium 4,4'-(7-butoxy-1-isoindolyl)2,2'-stilbenedisulfonate; disodium 4,4'-(6-trifluoromethyl-1-isoindolyl)2,2'-stilbenedisulfonate; disodium 4,4'-(6-(1,4,7-trioxanonyl)-1-isoindolyl)2,2'-stilbenedisulfonate; disodium 4,4'-(7-methoxymethyl-1-isoindolyl)2,2'-stilbenedisulfonate; disodium 4,4'-(6-phenyl-1-isoindolyl)2,2'-stilbenedisulfonate; disodium 4,4'-(6-naphthyl-1-isoindolyl)2,2'-stilbenedisulfonate; disodium 4,4'-(6-methylsulfonyl-1-isoindolyl)2,2'-stilbenedisulfonate; disodium 4,4'-(7-cyano-1-isoindolyl)2,2'-stilbenedisulfonate; and disodium m 4,4'-(7-(1,2,3-trihydroxypropyl)-1-isoindolyl)2,2'-stilbenedisulfonate; disodium 4-isoindolyl-4'-ethoxy-2,2'-stilbenedisulfonate; disodium 4-isoindolyl-4'-methoxy-2,2'-stilbenedisulfonate; disodium 4-isoindolyl-4'-ethoxy-2,2'-stilbenedisulfonamide; disodium 4-isoindolyl-4'-methyl-2,2'-stilbenedisulfonamide; disodium 4,4'-bis-(2-diethanolamino-4-anilino-s-triazin-6-ylamino)stilbene-2:2 disulphonate, disodium 4,4'-bis-(2-morpholino-4-anilino-s-triazin-6-ylamino)-stilbene-2:2'-disulphonate, disodium 4,4'-bis-(2,4-dianilino -s-triazin-6-ylamino)-stilbene-2-sulphonate, monosodium 4,4'-bis-(2,4-dianilino -s-triazin-6-

ylamino)-stilbene-2,2'-disulphonate, disodium 4,4'-bis-(2-anilino-4-(N-methyl-N-2-hydroxyethylamino)-s-triazin-6-ylamino)stilbene-2,2'-disulphonate, disodium 4,4'-bis-(4-phenyl-2,1,3-triazol-2-yl)-stilbene-2,2' disulphonate, disodium 4,4'-bis-(2-anilino-4-(1-methyl-2-hydroxyethylamino)-s-triazin-6-ylamino)-stilbene-2,2'-disulphonate, sodium 2-(stilbyl-4''-(naphtho-1',2':4,5)-1,2,3-triazole-2''-sulphonate, 4,4'-bis-(2-sulphostyryl)-biphenyl, 4,4'-bis(4-phenyl-2H-1,2,3-triazol-2-yl)-2,2'-stilbenedisulfonic acid and mixture thereof. See also U.S. Patent 3,646,015, U.S. Patent 3,346,502 and U.S. Patent 3,393,153 for further examples of brighteners useful herein.

[0053] Indeed one of the functionally equivalent derivative salts of 4,4'-bis(4-phenyl-2H-1,2,3-triazol-2-yl)-2,2'-stilbenedisulfonic acid, namely its sodium salt is available from Mobay Chemical Corporation, a subsidiary of Bayer AG under the name Phorwite® CAN. The amine salt is available from Molay under the name Phorwite® CL solution. The potassium salt is available under the name Phorwite® BHC 766.

[0054] Specific examples of hydrophilic optical brighteners useful in the present invention are those having the structural formula:



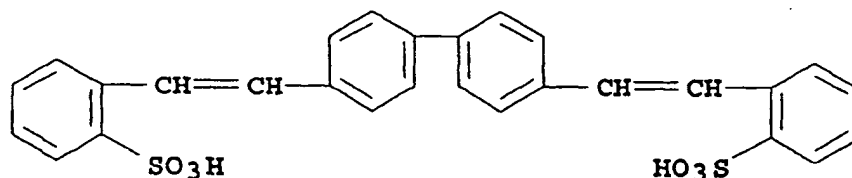
wherein R₁ is selected from anilino, N-2-bis-hydroxyethyl and NH-2-hydroxyethyl; R₂ is selected from N-2-bis-hydroxyethyl, N-2-hydroxyethyl-N-methylamino, morphilino, chloro and amino; and M is a salt-forming cation such as sodium or potassium.

[0055] When in the above formula, R₁ is anilino, R₂ is N-2-bis-hydroxyethyl and M is a cation such as sodium, the brightener is 4,4'-bis[(4-anilino-6-(N-2-bis-hydroxyethyl)-s-triazine-2-yl)amino]-2,2'-stilbenedisulfonic acid and disodium salt. This particular brightener species is commercially marketed under the tradename Tinopal-UNPA-GX by from Ciba Specialty Chemicals. Tinopal-UNPA-GX is the preferred hydrophilic optical brightener useful in the detergent compositions herein.

[0056] When in the above formula, R₁ is anilino, R₂ is N-2-hydroxyethyl-N-2-methylamino and M is a cation such as sodium, the brightener is 4,4'-bis[(4-anilino-6-(N-2-hydroxyethyl-N-methylamino)-s-triazine-2-yl)amino]-2,2'-stilbenedisulfonic acid disodium salt. This particular brightener species is commercially marketed under the tradename Tinopal 5BM-GX by from Ciba Specialty Chemicals.

[0057] When in the above formula, R₁ is anilino, R₂ is morphilino and M is a cation such as sodium, the brightener is 4,4'-bis[(4-anilino-6-morphilino-s-triazine-2-yl)amino]-2,2'-stilbenedisulfonic acid, sodium salt. This particular brightener species is commercially marketed under the tradename Tinopal AMS-GX by from Ciba Specialty Chemicals.

[0058] Other substituted stilbene 2,2'-disulfonic acid derivatives also include 4,4'-bis (2-2' styryl sulfonate) biphenyl having the structural formula :



• 2 Na

[0059] Suitable 4,4'-bis (2-2' styryl sulfonate) biphenyl are commercially available from Ciba Specialty Chemicals under the trade name Brightener 49® or Tinopal CBS® or other hydrophilic brighteners like for example Brightener 3® or Brightener 47®, also commercially available from Ciba Specialty Chemicals.

[0060] Specific examples of hydrophobic brighteners useful in the present invention include the polycyclic oxazole derivatives such as benzo-oxazole derivatives, or mixtures thereof and particularly preferred herein the benzo-oxazole derivatives. An example of such a brightener is benzoxazole,2,2'-(thiophenaldyl)bis having the following formula $C_{18}H_{10}N_2O_2S$, commercially available from Ciba Specialty Chemicals under the trade name Tinopal SOP®. This brightener is almost insoluble in water, i.e. it has a solubility being lower than 1 gram per liter. Another example of such a brightener is bis(sulfobenzofuranyl)biphenyl, commercially available from Ciba Specialty Chemicals under the trade name Tinopal PLC®.

[0061] By "hydrophobic brighteners", it is meant any brightener having a solubility such that no more than 10 grams of brightener can be fully dissolved in 1 liter of deionized water at 25°C. By "fully dissolved" it is meant that a clear and stable solution is obtained. Accordingly, by "hydrophilic brighteners", it is to be understood herein any brightener having a solubility such that more than 10 grams of brightener can be fully dissolved in 1 liter of deionized water at 25°C.

[0062] Preferably, the composition used in the process according to the present invention comprises a brightener selected from the group consisting of hydrophobic brighteners, hydrophilic brighteners and mixtures thereof.

[0063] The compositions according to the present invention may comprise from 0.001% to 10%, preferably from 0.005% to 5%, more preferably from 0.005% to 1% and most preferably from 0.008% to 0.5% by weight of the total composition of a brightener or a mixture thereof.

[0064] It has now surprisingly been found that when a liquid carpet treatment composition comprising a brightener as described herein, is applied onto a carpet in a process as described herein, said carpet is perceived by a person looking at said carpet as cleaner versus a carpet treated with a similar composition not comprising a brightener ("improved perceived cleanliness"). It is believed that said improved perceived cleanliness is provided by two causes. Firstly, it is due to an improved cleaning performance ("carpet cleaning benefit") of the carpet treatment composition herein, when both used to clean the whole carpet, localized carpet stains or soiled high traffic areas. Secondly, it is due to a "soil-hiding benefit" provided by the carpet treatment composition herein. By "soil-hiding benefit" it is meant herein that although soil is still present on a carpet, it is hidden from a person looking at said carpet by the light scattering effect described below.

[0065] The soil-hiding benefit is based on the fact that said brightener is deposited on the carpet fibers during the carpet treatment and remains on said carpet fibers after the treatment has finished. Moreover, it has been observed that even when said composition, preferably said composition and soil, are removed from said carpet, the brightener remains adhered to the carpet. It is believed that the brighteners present in the composition of the present invention are able to modify the physical-chemical properties of the surface of a carpet treated therewith, more particularly the physical-chemical properties of the carpet fibers.

[0066] Although not wishing to be bound by theory, it has been observed that the brightener when deposited on the carpet fiber increases the light scattering of said fiber and thus of the whole carpet surface treated with a composition according to the present invention. Said increase in light scattering increases the reflectance of the carpet surface and in turn provides the "soil-hiding benefit". Thus, said carpet is not perceived as being soiled and an improved perceived cleanliness is observed. The spraying of a brightener, contributes to the overall perceived cleanliness of the carpet in addition to the cleaning performance of the carpet treatment composition herein, even without applying mechanical action when treating a carpet. The soil-hiding benefit is observed in addition to the expected whitening effect (fluorescence) of the brightener that, for instance, can be observed on fabrics, which are washed with a laundry detergent comprising a brightener.

[0067] The compositions employed in the process of treating carpets according to the present invention provide soil-hiding benefits and carpet cleaning benefits on various types of soils including diffuse soils (e.g., particulate and/or greasy soils) that tend to accumulate in the so called "high traffic areas" but also in delivering good cleaning performance on other types of stains or soils, i.e., proteinic stains like blood.

[0068] By "high traffic areas" it is meant herein areas with an intensive use of the carpets in such areas as for example near doors.

[0069] By "particulate stains" it is meant herein any soils or stains of particulate nature that can be found on any carpet, e.g. clay, dirt, dust, mud, concrete and the like.

[0070] By "greasy/oily stains" it is meant herein any soils or stains of greasy/oily nature that can be found on any carpet, e.g., make-up, lipstick, dirty motor oil and mineral oil, greasy food like mayonnaise and spaghetti sauce.

[0071] By "proteinic stains" it is meant herein any soils or stains of proteinic nature that can be found on any carpet, e.g., grass.

[0072] The perceived cleanliness, i.e., the soil-hiding benefits and the carpet cleaning benefits, of a carpet treatment composition can be assessed by the following test method: A liquid composition according to the present invention is first sprayed, onto the stained portion of a carpet, left to act thereon from 1 to 60 minutes, preferably 30 minutes, after which the carpet is vacuum cleaned using any commercially available vacuum cleaners like for instance a standard Hoover® 1300W vacuuming machine. The soils used in this test may be particulate stains,

greasy/oily stains or proteinic stain as described above. The soil hiding benefits and the carpet cleaning benefits of said carpet treatment composition can be assessed by visual grading. The visual grading may be performed by a group of expert panelists using panel score units (PSU). To assess the soil-hiding benefits and the carpet cleaning benefits of a given composition a PSU-scale ranging from 0, meaning no noticeable difference in cleanliness of a treated, initially soiled, carpet versus an untreated, similarly soiled, carpet, to 4, meaning a clearly noticeable difference in cleanliness of a treated, initially soiled, carpet versus an untreated, similarly soiled, carpet, can be applied.

Optional ingredients

Peroxygen bleach

[0073] As an optional but highly preferred ingredient the compositions according to the present invention may comprise a peroxygen bleach.

[0074] Suitable peroxygen bleaches to be used herein are selected from the group consisting of: hydrogen peroxide; water soluble sources of hydrogen peroxide; organic or inorganic peracids; hydroperoxides; diacyl peroxides; and mixtures thereof.

[0075] As used herein a hydrogen peroxide source refers to any compound that produces perhydroxyl ions when said compound is in contact with water. Suitable water-soluble sources of hydrogen peroxide for use herein are selected from the group consisting of percarbonates, perborates and persulfates and mixtures thereof.

[0076] Suitable diacyl peroxides for use herein are selected from the group consisting of aliphatic, aromatic and aliphatic-aromatic diacyl peroxides, and mixtures thereof.

[0077] Suitable aliphatic diacyl peroxides for use herein are dilauroyl peroxide, didecanoil peroxide, dimyristoyl peroxide, or mixtures thereof. A suitable aromatic diacyl peroxide for use herein is for example benzoyl peroxide. A suitable aliphatic-aromatic diacyl peroxide for use herein is for example lauroyl benzoyl peroxide. Such diacyl peroxides have the advantage to be particularly safe to carpets and carpet dyes while delivering excellent bleaching performance.

[0078] Suitable organic or inorganic peracids for use herein are selected from the group consisting of: persulfates such as monopersulfate; peroxyacids such as diperoxydodecandioic acid (DPDA) and phthaloyl amino peroxycaproic acid (PAP); magnesium perphthalic acid; perlauric acid; perbenzoic and alkylperbenzoic acids; and mixtures thereof.

[0079] Suitable hydroperoxides for use herein are selected from the group consisting of tert-butyl hydroperoxide, cumyl hydroperoxide, 2,4,4-trimethylpentyl-2-hydroperoxide, di-isopropylbenzene-monohydroperoxide, tert-amyl hydroperoxide and 2,5-dimethyl-hexane-2,5-dihydroperoxide and mixtures thereof. Such hydroperoxides have the advantage to be particularly safe to carpets and carpet dyes while delivering excellent bleaching performance.

[0080] Preferred peroxygen bleaches herein are selected from the group consisting of: hydrogen peroxide; water soluble sources of hydrogen peroxide; organic or inorganic peracids; hydroperoxides; and diacyl peroxides; and mixtures thereof. More preferred peroxygen bleaches herein are selected from the group consisting of hydrogen peroxide, water soluble sources of hydrogen peroxide and diacyl peroxides and mixtures thereof. Even more preferred peroxygen bleaches herein are selected from the group consisting of hydrogen peroxide, water soluble sources of hydrogen peroxide, aliphatic diacyl peroxides, aromatic diacyl peroxides and aliphatic-aromatic diacyl peroxides and mixtures thereof. Most preferred peroxygen bleaches herein are hydrogen peroxide, water soluble sources of hydrogen peroxide or mixtures thereof.

[0081] Typically, the liquid compositions herein comprise from 0.01% to 20%, preferably from 0.5 % to 10%, and more preferably from 1% to 7% by weight of the total composition of a peroxygen bleach, or mixtures thereof.

[0082] The presence of a peroxygen bleach in preferred compositions employed in the process of treating a carpet according to the present invention contributes to the excellent cleaning and sanitizing performance on various types of soils including on spot stains like bleachable stains (e.g., coffee, beverage, food) of the compositions of the present invention.

[0083] By "bleachable stains" it is meant herein any soils or stains containing ingredients sensitive to bleach that can be found on any carpet, e.g., coffee or tea.

Surfactants

[0084] As an optional but highly preferred ingredient the compositions according to the present invention may comprise a surfactant or a mixture thereof.

[0085] Typically, the compositions herein may comprise up to 50%, preferably from 0.1% to 20%, more preferably from 0.5% to 10% and most preferably from 1% to 5% by weight of the total composition of a surfactant.

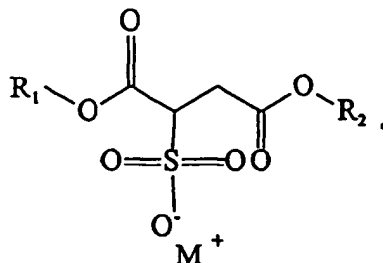
[0086] Such surfactants may be selected from those well known in the art including anionic, nonionic,

zwitterionic, amphoteric and cationic surfactants and mixtures thereof.

[0087] Particularly suitable surfactants to be used herein are anionic surfactants. Said anionic surfactants are preferred herein as they further contribute to the outstanding stain removal performance of the compositions of the present invention on various types of stains. Moreover they do not stick on carpet, thereby reducing resoiling.

[0088] Suitable anionic surfactants include sulfosuccinate surfactants, sulfosuccinamate surfactants, sulfosuccinamide surfactants, alkyl carboxylate surfactants, sarcosinate surfactants, alkyl sulfate surfactants, alkyl sulphonate surfactants, alkyl glycerol sulfate surfactants, alkyl glycerol sulphonate surfactants and mixtures thereof.

[0089] Suitable sulfosuccinate surfactants are according to the formula



wherein : R₁ is hydrogen or a hydrocarbon group selected from the group consisting of straight or branched alkyl radicals containing from 6 to 20 carbon atoms, preferably 8 to 18 carbon atoms, more preferably 10 to 16 carbon atoms, and alkyl phenyl radicals containing from 6 to 18 carbon atoms in the alkyl group; R₂ is a hydrocarbon group selected from the group consisting of straight or branched alkyl radicals containing from 6 to 20 carbon atoms, preferably 8 to 18 carbon atoms, more preferably 10 to 16 carbon atoms, and alkyl phenyl radicals containing from 6 to 18 carbon atoms in the alkyl group; and M is hydrogen or a cationic moiety, e.g., an alkali metal cation (e.g., sodium, potassium, lithium, calcium, magnesium and the like) or ammonium or substituted ammonium (e.g., methyl-, dimethyl-, and trimethyl ammonium cations and quaternary ammonium cations, such as tetramethyl-ammonium and dimethyl piperdinium cations and quaternary ammonium cations derived from alkylamines such as ethylamine, diethylamine, triethylamine, and mixtures thereof, and the like).

[0090] Such sulfosuccinate surfactants are commercially available under the tradenames Aerosol® from Cytec, Anionyx® from Stepan, Arylene® from Hart, Setacin® from Zschimmer & Schwarz, Mackanate® from McIntyre and Monawet® from Mona Industries.

[0091] Suitable alkyl sulphonate surfactants for use herein include water-soluble salts or acids of the formula RSO₃M wherein R is a C₆-C₂₀ linear or branched, saturated or unsaturated alkyl group, preferably a C₈-C₁₈ alkyl group and more preferably a C₁₀-C₁₆ alkyl group, and M is H or a cation, e.g., an alkali metal cation (e.g., sodium, potassium, lithium), or ammonium or substituted ammonium (e.g., methyl-, dimethyl-, and trimethyl ammonium cations and quaternary ammonium cations, such as tetramethyl-ammonium and dimethyl piperdinium cations and quaternary ammonium cations derived from alkylamines such as ethylamine, diethylamine, triethylamine, and mixtures thereof, and the like).

[0092] An example of a C₁₄-C₁₆ alkyl sulphonate is Hostapur® SAS available from Hoechst.

[0093] Suitable alkyl sulphate surfactants for use herein are according to the formula R₁SO₄M wherein R₁ represents a hydrocarbon group selected from the group consisting of straight or branched alkyl radicals containing from 6 to 20, preferably 8 to 18, more preferably 10 to 16, carbon atoms and alkyl phenyl radicals containing from 6 to 18 carbon atoms in the alkyl group. M is H or a cation, e.g., an alkali metal cation (e.g., sodium, potassium, lithium, calcium, magnesium and the like) or ammonium or substituted ammonium (e.g., methyl-, dimethyl-, and trimethyl ammonium cations and quaternary ammonium cations, such as tetramethyl-ammonium and dimethyl piperdinium cations and quaternary ammonium cations derived from alkylamines such as ethylamine, diethylamine, triethylamine, and mixtures thereof, and the like).

[0094] By "linear alkyl sulphate or sulphonate" it is meant herein a non-substituted alkyl sulphate or sulphonate wherein the alkyl chain comprises from 6 to 20 carbon atoms, preferably from 8 to 18 carbon atoms, and more preferably from 10 to 16 carbon atoms, and wherein this alkyl chain is sulphated or sulphonated at one terminus.

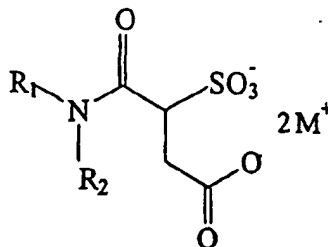
[0095] By "branched sulphonate or sulphate", it is meant herein an alkyl chain having from 6 to 20 total carbon atoms, preferably from 8 to 18 total carbon atoms, and more preferably from 10 to 16 total carbon atoms, wherein the main alkyl chain is substituted by at least another alkyl chain, and wherein the alkyl chain is sulphated or sulphonated at one terminus.

[0096] Particularly preferred branched alkyl sulphates to be used herein are those containing from 10 to 14 total carbon atoms like Isalchem 123 AS®. Isalchem 123 AS® commercially available from Enichem is

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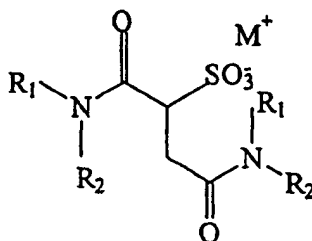
a C₁₂₋₁₃ surfactant which is 94% branched. This material can be described as CH₃-(CH₂)_m-CH(CH₂OSO₃Na)-(CH₂)_n-CH₃ where n+m = 8-9. Also preferred alkyl sulphates are the alkyl sulphates where the alkyl chain comprises a total of 12 carbon atoms, i.e., sodium 2-butyl octyl sulphate. Such alkyl sulphate is commercially available from Condea under the trade name Isofol® 12S. Particularly suitable linear alkyl sulphonates include C12-C16 paraffin sulphonate like Hostapur® SAS commercially available from Hoechst.

[0097] Suitable sulfosuccinamate surfactants for use herein are according to the formula



wherein R₁ and R₂ each independently represent a hydrocarbon group selected from the group consisting of straight or branched alkyl radicals containing from 6 to 20, preferably 8 to 18, more preferably 10 to 16, carbon atoms and alkyl phenyl radicals containing from 6 to 18 carbon atoms in the alkyl group. M is H or a cation, e.g., an alkali metal cation (e.g., sodium, potassium, lithium, calcium, magnesium and the like) or ammonium or substituted ammonium (e.g., methyl-, dimethyl-, and trimethyl ammonium cations and quaternary ammonium cations, such as tetramethyl-ammonium and dimethyl piperdinium cations and quaternary ammonium cations derived from alkylamines such as ethylamine, diethylamine, triethylamine, and mixtures thereof, and the like).

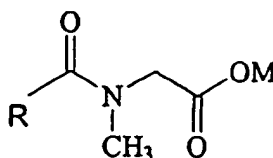
[0098] Suitable sulfosuccinamide surfactants for use herein are according to the formula



wherein R₁ and R₂ each independently represent a hydrocarbon group selected from the group consisting of straight or branched alkyl radicals containing from 6 to 20, preferably 8 to 18, more preferably 10 to 16, carbon atoms and alkyl phenyl radicals containing from 6 to 18 carbon atoms in the alkyl group. M is H or a cation, e.g., an alkali metal cation (e.g., sodium, potassium, lithium, calcium, magnesium and the like) or ammonium or substituted ammonium (e.g., methyl-, dimethyl-, and trimethyl ammonium cations and quaternary ammonium cations, such as tetramethyl-ammonium and dimethyl piperdinium cations and quaternary ammonium cations derived from alkylamines such as ethylamine, diethylamine, triethylamine, and mixtures thereof, and the like).

[0099] Suitable alkyl carboxylate surfactants for use herein are according to the formula RCO₂M wherein : R represents a hydrocarbon group selected from the group consisting of straight or branched alkyl radicals containing from 6 to 20, preferably 8 to 18, more preferably 10 to 16, carbon atoms and alkyl phenyl radicals containing from 6 to 18 carbon atoms in the alkyl group. M is H or a cation, e.g., an alkali metal cation (e.g., sodium, potassium, lithium, calcium, magnesium and the like) or ammonium or substituted ammonium (e.g., methyl-, dimethyl-, and trimethyl ammonium cations and quaternary ammonium cations, such as tetramethyl-ammonium and dimethyl piperdinium cations and quaternary ammonium cations derived from alkylamines such as ethylamine, diethylamine, triethylamine, and mixtures thereof, and the like).

[0100] Suitable sarcosinate surfactants to be used herein include acyl sarcosinate or mixtures thereof, in its acid and/or salt form, preferably long chain acyl sarcosinates having the following formula:



wherein M is hydrogen or a cationic moiety and wherein R is an alkyl group of from 11 to 15 carbon atoms, preferably of from 11 to 13 carbon atoms. Preferred M are hydrogen and alkali metal salts, especially sodium and potassium. Said acyl sarcosinate surfactants are derived from natural fatty acids and the amino-acid sarcosine (N-methyl glycine). They are suitable to be used as aqueous solution of their salt or in their acidic form as powder. Being derivatives of natural fatty acids, said acyl sarcosinates are rapidly and completely biodegradable and have good skin compatibility.

[0101] Accordingly, particularly preferred long chain acyl sarcosinates to be used herein include C₁₂ acyl sarcosinate, i.e., an acyl sarcosinate according to the above formula wherein M is hydrogen and R is an alkyl group of 11 carbon atom, sodium N-lauroyl sarcosinate, i.e., an acyl sarcosinate according to the above formula wherein M is sodium and R is an alkyl group of 11 carbon atom, and C₁₄ acyl sarcosinate (i.e., an acyl sarcosinate according to the above formula wherein M is hydrogen and R is an alkyl group of 13 carbon atoms). , sodium N-lauroyl sarcosinate is commercially available, for example, as Hamposyl L-30® supplied by Hampshire or Crodasinc LS30® supplied by Croda. C₁₄ acyl sarcosinate is commercially available, for example, as Hamposyl M-30® supplied by Hampshire or Crodasinc MS30® supplied by Croda.

[0102] Suitable nonionic surfactants include amine oxide surfactants. Suitable amine oxide surfactants are according to the formula R₁R₂R₃NO, wherein each of R₁, R₂ and R₃ is independently a saturated substituted or unsubstituted, linear or branched alkyl groups of from 1 to 30 carbon atoms, preferably of from 1 to 20 carbon atoms, and mixtures thereof.

[0103] Particularly preferred amine oxide surfactants to be used according to the present invention are amine oxide surfactants having the following formula R₁R₂R₃NO wherein R₁ is a saturated linear or branched alkyl group of from 1 to 30 carbon atoms, preferably of from 6 to 20 carbon atoms, more preferably of from 6 to 16 carbon atoms, and wherein R₂ and R₃ are independently substituted or unsubstituted, linear or branched alkyl groups of from 1 to 4 carbon atoms, preferably of from 1 to 3 carbon atoms, and more preferably are methyl groups. Preferred amine oxide surfactants used herein are pure-cut amine oxide surfactants, i.e., a pure single amine oxide surfactant, e.g. C₈ N,N-dimethyl amine oxide, as opposed to mixtures of amine oxide surfactants of different chain lengths

[0104] Suitable amine oxide surfactants for use herein are for instance pure cut C₈ amine oxide, pure cut C₁₀ amine oxide, pure cut C₁₄ amine oxide, natural blend C₈-C₁₀ amine oxides as well as natural blend C₁₂-C₁₆ amine oxides. Such amine oxide surfactants may be commercially available from Hoechst or Stephan.

[0105] Suitable nonionic surfactants for use herein also include any ethoxylated C₆-C₂₄ fatty alcohol nonionic surfactant, alkyl propoxylates and mixtures thereof, fatty acid C₆-C₂₄ alkanolamides, C₆-C₂₀ polyethylglycol ethers, polyethylene glycol with molecular weight 1000 to 80000 and glucose amides, alkyl pyrrolidones.

[0106] Suitable cationic surfactants for use herein include quaternary ammonium compounds of the formula R₁R₂R₃R₄N⁺ where R₁, R₂ and R₃ are methyl groups, and R₄ is a C₁₂₋₁₅ alkyl group, or where R₁ is an ethyl or hydroxy ethyl group, R₂ and R₃ are methyl groups and R₄ is a C₁₂₋₁₅ alkyl group.

[0107] Suitable zwitterionic surfactants are zwitterionic betaine surfactants. Suitable zwitterionic betaine surfactants for use herein contain both a cationic hydrophilic group, i.e., a quaternary ammonium group, and anionic hydrophilic group on the same molecule at a relatively wide range of pH's. The typical anionic hydrophilic groups are carboxylates and sulphonates, although other groups like sulfates, phosphonates, and the like can be used. A generic formula for the zwitterionic betaine surfactant to be used herein is :



wherein R₁ is a hydrophobic group; R₂ is hydrogen, C₁-C₆ alkyl, hydroxy alkyl or other substituted C₁-C₆ alkyl group; R₃ is C₁-C₆ alkyl, hydroxy alkyl or other substituted C₁-C₆ alkyl group which can also be joined to R₂ to form ring structures with the N, or a C₁-C₆ sulphonate group; R₄ is a moiety joining the cationic nitrogen atom to the hydrophilic group and is typically an alkylene, hydroxy alkylene, or polyalkoxy group containing from 1 to 10 carbon atoms; and X is the hydrophilic group, which is a carboxylate or sulphonate group.

[0108] Preferred hydrophobic groups R₁ are aliphatic or aromatic, saturated or unsaturated, substituted or unsubstituted hydrocarbon chains that can contain linking groups such as amido groups, ester groups. More preferred R₁ is an alkyl group containing from 1 to 24, preferably from 8 to 18, and more preferably from 10 to 16 carbon atoms. These simple alkyl groups are preferred for cost and stability reasons. However, the hydrophobic group R₁ can

also be an amido radical of the formula $R_a-C(O)-NH-(C(R_b)_2)_m$, wherein R_a is an aliphatic or aromatic, saturated or unsaturated, substituted or unsubstituted hydrocarbon chain, preferably an alkyl group containing from 8 up to 20, preferably up to 18, more preferably up to 16 carbon atoms, R_b is selected from the group consisting of hydrogen and hydroxy groups, and m is from 1 to 4, preferably from 2 to 3, more preferably 3, with no more than one hydroxy group in any $(C(R_b)_2)_m$ moiety.

[0109] Preferred R_2 is hydrogen, or a C_1 - C_3 alkyl and more preferably methyl. Preferred R_3 is C_1 - C_4 sulphonate group, or a C_1 - C_3 alkyl and more preferably methyl. Preferred R_4 is $(CH_2)_n$ wherein n is an integer from 1 to 10, preferably from 1 to 6, more preferably is from 1 to 3.

[0110] Some common examples of betaine/sulphobetaine are described in U.S. Pat. Nos. 2,082,275, 2,702,279 and 2,255,082, incorporated herein by reference.

[0111] Examples of particularly suitable alkyldimethyl betaines include coconut-dimethyl betaine, lauryl dimethyl betaine, decyl dimethyl betaine, 2-(N-decyl-N, N-dimethyl-ammonia)acetate, 2-(N-coco N, N-dimethylammonio) acetate, myristyl dimethyl betaine, palmityl dimethyl betaine, cetyl dimethyl betaine, stearyl dimethyl betaine. For example Coconut dimethyl betaine is commercially available from Seppic under the trade name of Amony 265®. Lauryl betaine is commercially available from Albright & Wilson under the trade name Empigen BB/L®.

[0112] Examples of amidobetaines include cocoamidoethylbetaine, cocoamidopropyl betaine or C_{10} - C_{14} fatty acylamidopropylene(hydropropylene)sulfobetaine. For example C_{10} - C_{14} fatty acylamidopropylene(hydropropylene) sulfobetaine is commercially available from Sherex Company under the trade name "Varion CAS® sulfobetaine".

[0113] A further example of betaine is Lauryl-immino-dipropionate commercially available from Rhone-Poulenc under the trade name Mirataine H2C-HA®.

[0114] A preferred surfactant for use herein is an anionic surfactant or a zwitterionic surfactant or a mixture thereof, a more preferred surfactant is a sulfosuccinate surfactant, sulfosuccinamate surfactant, sulfosuccinamide surfactant, carboxylate surfactant, sarcosinate surfactant, alkyl sulfate surfactant, alkyl sulphonate surfactant, alkyl glycerol sulfate surfactant, alkyl glycerol sulphonate surfactant or a zwitterionic betaine surfactant and mixtures thereof.

[0115] In a preferred embodiment a preferred surfactant for use herein is a sarcosinate surfactant, an alkyl sulphonate surfactant, an alkyl sulphate surfactant, or a zwitterionic betaine surfactant and mixtures thereof, and the most preferred surfactant herein is an alkyl sarcosinate surfactant.

[0116] In another preferred a preferred surfactant for use herein is a mixture of a sulfosuccinate surfactant and a second anionic surfactant. More preferably, said surfactant is a mixture of a sulfosuccinate surfactant and a sulphate surfactant. Most preferably, said surfactant is a sulfosuccinate surfactant.

[0117] The presence of a surfactant in preferred compositions when employed in the process of treating a carpet according to the present invention contributes to the excellent cleaning performance on various types of soils including diffuse soils (e.g., particulate and/or greasy soils) that tend to accumulate in the so called "high traffic areas" but also in delivering good cleaning performance on other types of stains or soils, i.e., proteinic stains like blood.

Volatile organic compounds

[0118] As an optional but highly preferred ingredient the compositions according to the present invention may comprise a volatile organic compound (VOC) or a mixture thereof.

[0119] Typically, the compositions herein may comprise up to 90%, preferably from 0.1% to 20%, more preferably from 0.5% to 10% and most preferably from 1% to 5% by weight of the total composition of a volatile organic compound or a mixture thereof.

[0120] Suitable volatile organic compounds for use herein include aliphatic and/or aromatic alcohol, glycol ethers and/or derivatives thereof, polyol and mixtures thereof.

[0121] Suitable aromatic alcohols to be used herein are according to the formula R_1-OH wherein R_1 is an alkyl substituted or non-alkyl substituted aryl group of from 1 to 20 carbon atoms, preferably from 2 to 15 and more preferably from 2 to 10. A suitable aromatic alcohol to be used herein is benzyl alcohol.

[0122] Suitable aliphatic alcohols to be used herein are according to the formula R_2-OH wherein R_2 is a linear or branched saturated or unsaturated hydrocarbon chain of from 1 to 20 carbon atoms, preferably from 1 to 10 and more preferably from 2 to 6. Highly preferred herein are aliphatic alcohols with 2 to 4 carbon atoms and most preferably 4 carbon atoms, or mixtures thereof. Suitable aliphatic alcohols to be used herein include linear alcohol like 2-octanol, decanol, isopropyl alcohol, propyl alcohol, ethanol and/or methanol. Highly preferred herein are ethanol, isopropyl alcohol or a mixture thereof.

[0123] Ethanol may be commercially available from Eridania Italia under its chemical name.

[0124] Isopropyl alcohol may be commercially available from Merck/BDH Italia under its chemical name.

[0125] Suitable glycol ethers and/or derivatives thereof to be used herein include monoglycol ethers and/or

derivatives thereof, polyglycol ethers and/or derivatives thereof and mixtures thereof.

[0126] Suitable monoglycol ethers and derivatives thereof to be used herein include n-butoxypropanol (n-BP), water-soluble CELLOSOLVE® solvents or mixtures thereof. Preferred Cellosolve® solvents include propoxy ethyl acetate salt (i.e., Propyl Cellosolve acetate salt®), ethanol-2-butoxy phosphate salt (i.e., Butyl Cellosolve phosphate salt®), 2-(Hexyloxy)ethanol (i. ., 2-hexyl Cellosolve®), 2-ethoxy ethanol (i.e., 2-ethyl Cellosolve®), 2-butoxyethanol (i.e., 2-butyl Cellosolve®) or mixtures thereof.

[0127] Suitable polyglycol ethers and derivatives thereof to be used herein include n-butoxypropoxypropanol (n-BPP), butyl triglycol ether (BTGE), butyl diglycol ether (BDGE), water-soluble CARBITOL® solvents or mixtures thereof.

[0128] Preferred water-soluble CARBITOL® solvents are compounds of the 2-(2-alkoxyethoxy)ethanol class, 2-(2-alkoxyethoxy)propanol class and/or 2-(2-alkoxyethoxy)butanol class wherein the alkoxy group is derived from ethyl, propyl or butyl. A preferred water-soluble carbitol is 2-(2-butoxyethoxy)ethanol also known as butyl carbitol®.

[0129] Preferred glycol ethers and/or derivatives thereof are 2-ethoxyethanol, 2-butoxyethanol, n-butoxypropoxypropanol, butyl carbitol® or mixtures thereof.

[0130] Suitable polyol solvents to be used herein are the polyols having at least 2 hydroxyl groups (-OH) like diols. Suitable diols to be used herein include 2-ethyl-1,3-hexanediol, 2,2,4-trimethyl-1,3-pentanediol, methyl-2,4-pentanediol or mixture thereof.

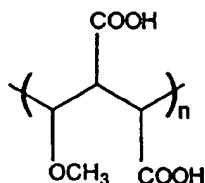
[0131] The volatile organic compounds, when present, further contribute to the excellent overall cleaning performance of the present invention. Additionally, their addition in the compositions herein also enhances the sanitising properties of the compositions.

Anti-resoiling agent

[0132] The compositions as disclosed herein may comprise as a preferred optional ingredient an anti-resoiling agent.

[0133] Suitable anti-resoiling agents include anti-resoiling polymers.

[0134] Suitable poly (vinyl methyl ether / maleic acid) copolymers are according to the general formula :



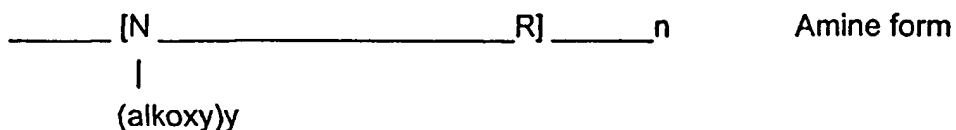
wherein n (degree of polymerisation) is an integer of from 50 to 1600, preferably from 100 to 800, and more preferably from 200 to 400.

[0135] Accordingly, suitable poly (vinyl methyl ether / maleic acid) copolymers for use herein have an average molecular weight of from 1'000 to 10'000'000, preferably 10'000 to 1'000'000, more preferably from 10'000 to 500'000, and most preferably from 50'000 to 100'000.

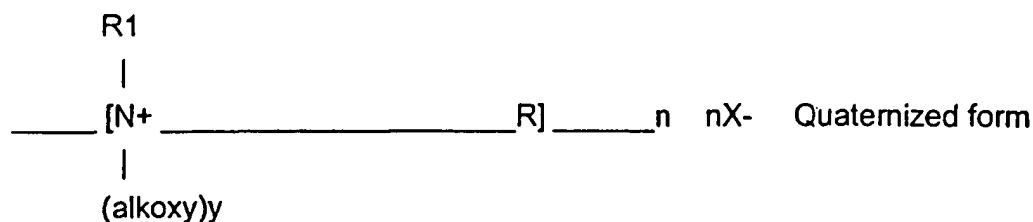
[0136] Suitable poly (vinyl methyl ether / maleic acid) copolymers are commercially available, for instance, from ISP Corporation, New York, NY and Montreal, Canada under the product names Gantrez AN Copolymer® (AN-119 copolymer, average molecular weight of 20'000; AN-139 copolymer, average molecular weight of 41'000; AN-149 copolymer, average molecular weight of 50'000; AN-169 copolymer, average molecular weight of 67'000; AN-179 copolymer, average molecular weight of 80'000), Gantrez S® (Gantrez S97®, average molecular weight of 70'000), and Gantrez ES® (ES-225, ES-335, ES-425, ES-435), Gantrez V® (V-215, V-225, V-425).

[0137] Preferably the poly (vinyl methyl ether / maleic acid) copolymers are either crosslinked or not crosslinked, i.e., linear. More preferably the poly (vinyl methyl ether / maleic acid) copolymers are not crosslinked.

[0138] Suitable anti-erosion polymers include soil suspending polyamine polymers. Any soil suspending polyamine polymer known to those skilled in the art may also be used herein. Particularly suitable polyamine polymers for use herein are alkoxyated polyamines. Such materials can conveniently be represented as molecules of the empirical structures with repeating units:

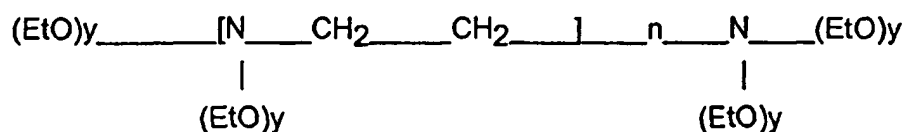


and



wherein R is a hydrocarbonyl group, usually of 2-6 carbon atoms; R₁ may be a C₁-C₂₀ hydrocarbon; the alkoxy groups are ethoxy, propoxy, and the like, and y is from 2 to 30, most preferably from 7 to 20; n is an integer of at least 2, preferably from 2 to 40, most preferably from 2 to 5; and X⁻ is an anion such as halide or methylsulfate, resulting from the quaternization reaction.

[0139] The most highly preferred polyamines for use herein are the so-called ethoxylated polyethylene amines, i.e., the polymerized reaction product of ethylene oxide with ethyleneimine, having the general formula :



wherein y is from 2 to 50, preferably from 5 to 30, and n is from 1 to 40, preferably from 2 to 40. Particularly preferred for use herein is an ethoxylated polyethylene amine, in particular an ethoxylated polyethylene amine wherein n=2 and y=20, and an ethoxylated polyethylene amine wherein n=40 and y=7.

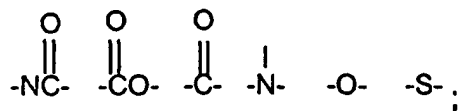
[0140] Suitable ethoxylated polyethylene amines are commercially available from Nippon Shokubai CO., LTD under the product names ESP-0620A® (ethoxylated polyethylene amine wherein n=2 and y=20) or from BASF under the product names ES-8165 and from BASF under the product name LUTENSIT K - 187/50® (ethoxylated polyethylene amine wherein n=40 and y=7).

[0141] Suitable anti-resoiling polymers also include polyamine N-oxide polymers.

[0142] Suitable polyamine N-oxide polymers for use herein are according to the following formula : R-A_x-P; containing at least one N-oxide group (N-O group);

wherein : P is a polymerizable unit to which an N-O group can be attached and/or the N-O group can form part of the polymerizable unit;

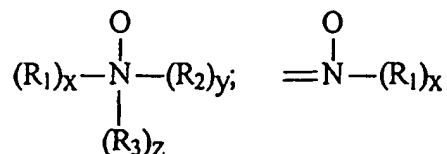
A is one of the following structures:



x is 0 or 1 ;

and R is an aliphatic, ethoxylated aliphatic, aromatic, heterocyclic or alicyclic group or any combination thereof to which the N-O group can be attached to R or the nitrogen of the N-O group is part of R.

[0143] By "N-O group" it is meant one of the following general structures:



wherein R_1 , R_2 , R_3 are aliphatic, aromatic, heterocyclic or alicyclic groups or combinations thereof; x , y and z are 0 or 1; and the nitrogen of the N-O group can be attached or form part of any of the aforementioned groups.

[0144] Any polymerizable unit P can be used as long as the amine oxide polymer formed is water-soluble and provides the carpet treatment composition with carpet cleaning and/or carpet anti-resoiling benefits. Preferred polymerizable unit P are vinyl, alkylenes, esters, ethers, amides, imides, acrylates and mixtures thereof. A more preferred polymerizable unit P is vinyl.

[0145] Preferred polyamine N-oxide polymers are those wherein R is a heterocyclic group such as pyridine, pyrrole, imidazole, or a derivative thereof, to which the nitrogen of the N-O group can be attached or the N-O group is part of these groups. Most preferred polyamine N-oxide polymers are those wherein R is a pyridine.

[0146] The polyamine N-oxide polymer can be obtained in almost any degree of polymerization. Typically, the average molecular weight is within the range of 1,000 to 100,000; more preferred 5,000 to 100,000; most preferred 5,000 to 25,000.

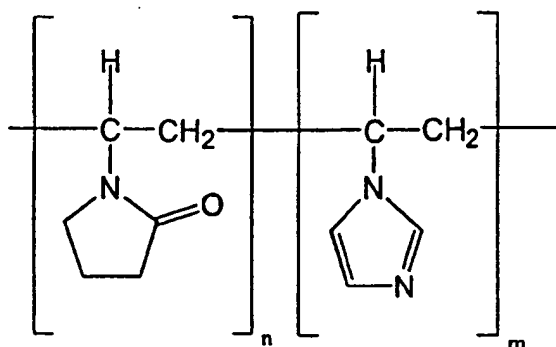
[0147] Suitable polyamine N-oxide polymer are polyvinyl pyridine-N-oxide polymers wherein : the polymerizable unit P is vinyl; $x=0$; and R is pyridine wherein the nitrogen of the N-O group is part of.

[0148] Suitable poly vinyl pyridine-N-oxide polymers are commercially available from Hoechst under the trade name of Hoe S 4268®, and from Reilly Industries Inc. under the trade name of PVNO.

[0149] Furthermore, suitable anti-resoiling polymers include N-vinyl polymer.

[0150] Suitable N-vinyl polymers include polyvinyl pyrrolidone polymers, co-polymers of N-vinylpyrrolidone and N-vinylimidazole, co-polymers of N-vinylpyrrolidone and acrylic acid, and mixtures thereof.

[0151] Suitable co-polymers of N-vinylpyrrolidone and N-vinylimidazole polymers (referred to as a class as "PVPVI") are according to the formula :



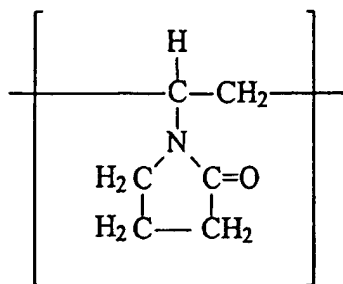
in which n is between 50 and 500 and preferably between 80 and 200 and m is between 50 and 500 and preferably between 80 and 200.

[0152] Preferably the PVPVI has an average molecular weight range from 1,000 to 100,000, more preferably from 5,000 to 100,000, and most preferably from 5,000 to 20,000. (The average molecular weight range is determined by light scattering as described in Barth, et al., Chemical Analysis, Vol 113. "Modern Methods of Polymer Characterization", the disclosures of which are incorporated herein by reference.)

[0153] The PVPVI co-polymers typically have a molar ratio of N-vinylimidazole to N-vinylpyrrolidone from 1:1 to 0.2:1, more preferably from 0.8:1 to 0.3:1, most preferably from 0.6:1 to 0.4:1. These co-polymers can be either linear or branched.

[0154] Suitable co-polymers of N-vinylpyrrolidone and N-vinylimidazole are commercially available from BASF, under the trade name of Sokalan® PG55.

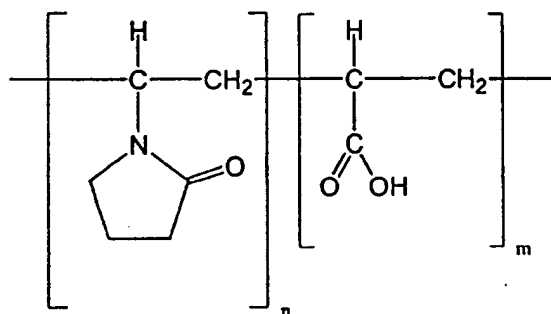
[0155] Suitable polyvinylpyrrolidone ("PVP") for use herein are homopolymers of N-vinylpyrrolidone having the following repeating monomer:



[0156] Preferred vinylpyrrolidone homopolymers for use herein have an average molecular weight of from 1,000 to 100,000, preferably from 5,000 to 100,000, and more preferably from 5,000 to 20,000.

[0157] Suitable vinylpyrrolidone homopolymers are commercially available from BASF under the trade names Luviskol® K15 (viscosity molecular weight of 10,000), Luviskol® K25 (viscosity molecular weight of 24,000), Luviskol® K30 (viscosity molecular weight of 40,000), and other vinylpyrrolidone homopolymers known to persons skilled in the detergent field (see for example EP-A-262,897 and EP-A-256,696).

[0158] Suitable co-polymers of N-vinylpyrrolidone and acrylic acid (referred to as a class as "PV/AA") are according to the formula :



in which n is between 50 and 1000 and preferably between 100 and 200 and m is between 150 and 3000 and preferably between 300 and 600.

[0159] Preferably the PV/AA have an average molecular weight range from 1,000 to 100,000, more preferably from 5,000 to 100,000, and most preferably from 5,000 to 25,000.

[0160] Suitable co-polymers of N-vinylpyrrolidone and acrylic acid are commercially available from BASF under the trade name Sokalan® PG 310.

[0161] Preferred N-vinyl polymers are polyvinyl pyrrolidone polymers, co-polymers of N-vinylpyrrolidone and N-vinylimidazole, co-polymers of N-vinylpyrrolidone and acrylic acid, and mixtures thereof, even more preferred are polyvinyl pyrrolidone polymers.

[0162] Suitable anti-resoiling polymers also include soil suspending polycarboxylate polymers.

[0163] Any soil suspending polycarboxylate polymer known to those skilled in the art can be used according to the present invention such as homo- or co-polymeric polycarboxylic acids or their salts including polyacrylates and copolymers of maleic anhydride or/and acrylic acid and the like. Indeed, such soil suspending polycarboxylate polymers can be prepared by polymerizing or copolymerizing suitable unsaturated monomers, preferably in their acid form. Unsaturated monomeric acids that can be polymerized to form suitable polymeric polycarboxylates include acrylic acid, maleic acid (or maleic anhydride), fumaric acid, itaconic acid, aconitic acid, mesaconic acid, citraconic acid and methylenemalononic acid. The presence in the polymeric polycarboxylates herein of monomeric segments, containing no carboxylate radicals such as vinylmethyl ether, styrene, ethylene, etc. is suitable provided that such segments do not constitute more than 40% by weight.

[0164] Particularly suitable polymeric polycarboxylates to be used herein can be derived from acrylic acid, including polyacrylic polymers and copolymers of acrylic acid. Most preferred anti-resoiling polymers are copolymer of acrylic acid and methacrylic acid. Such acrylic acid-based polymers which are useful herein are the water-soluble salts of polymerized acrylic acid. The average molecular weight of such polymers in the acid form preferably ranges from 2,000 to 10,000, more preferably from 4,000 to 7,000 and most preferably from 4,000 to 5,000. Water-soluble

salts of such acrylic acid polymers can include, for example, the alkali metal, ammonium and substituted ammonium salts. Soluble polymers of this type are known materials. Use of polyacrylates of this type in detergent compositions has been disclosed, for example, in Diehl, U.S. Patent 3,308,067, issued March 7, 1967.

[0165] Acrylic/maleic-based copolymers may also be used as a preferred soil suspending polycarboxylic polymer. Such materials include the water-soluble salts of copolymers of acrylic acid and maleic acid. The average molecular weight of such copolymers in the acid form preferably ranges from 2,000 to 100,000, more preferably from 5,000 to 75,000, most preferably from 7,000 to 65,000. The ratio of acrylate to maleate segments in such copolymers will generally range from 30:1 to 1:1, more preferably from 10:1 to 2:1. Water-soluble salts of such acrylic acid/maleic acid copolymers can include, for example, the alkali metal, ammonium and substituted ammonium salts. Soluble acrylate/maleate copolymers of this type are known materials which are described in European Patent Application No. 66915, published December 15, 1982. Particularly preferred is a copolymer of maleic / acrylic acid with an average molecular weight of 70,000. Such copolymers are commercially available from BASF under the trade name SOKALAN® CP5.

[0166] Other suitable anti-resoiling polymers include those anti-resoiling polymers having: (a) one or more nonionic hydrophile components consisting essentially of (i) polyoxyethylene segments with a degree of polymerization of at least 2, or (ii) oxypropylene or polyoxypropylene segments with a degree of polymerization of from 2 to 10, wherein said hydrophile segment does not encompass any oxypropylene unit unless it is bonded to adjacent moieties at each end by ether linkages, or (iii) a mixture of oxyalkylene units comprising oxyethylene and from 1 to about 30 oxypropylene units wherein said mixture contains a sufficient amount of oxyethylene units such that the hydrophile component has hydrophilicity great enough to increase the hydrophilicity of conventional polyester synthetic fiber surfaces upon deposit of the soil release agent on such surface, said hydrophile segments preferably comprising at least about 25% oxyethylene units and more preferably, especially for such components having about 20 to 30 oxypropylene units, at least about 50% oxyethylene units; or (b) one or more hydrophobe components comprising (i) C₃ oxyalkylene terephthalate segments, wherein, if said hydrophobe components also comprise oxyethylene terephthalate, the ratio of oxyethylene terephthalate: C₃ oxyalkylene terephthalate units is about 2:1 or lower, (ii) C₄-C₆ alkylene or oxy C₄-C₆ alkylene segments, or mixtures therein, (iii) poly (vinyl ester) segments, preferably polyvinyl acetate, having a degree of polymerization of at least 2, or (iv) C₁-C₄ alkyl ether or C₄ hydroxyalkyl ether substituents, or mixtures therein, wherein said substituents are present in the form of C₁-C₄ alkyl ether or C₄ hydroxyalkyl ether cellulose derivatives, or mixtures therein, and such cellulose derivatives are amphiphilic, whereby they have a sufficient level of C₁-C₄ alkyl ether and/or C₄ hydroxyalkyl ether units to deposit upon conventional polyester synthetic fiber surfaces and retain a sufficient level of hydroxyls, once adhered to such conventional synthetic fiber surface, to increase fiber surface hydrophilicity, or a combination of (a) and (b).

[0167] Typically, the polyoxyethylene segments of (a)(i) will have a degree of polymerization of from about 1 to about 200, although higher levels can be used, preferably from 3 to about 150, more preferably from 6 to about 100. Suitable oxy C₄-C₆ alkylene hydrophobe segments include, but are not limited to, end-caps of polymeric soil release agents such as MO₃S(CH₂)_nOCH₂CH₂O⁻, where M is sodium and n is an integer from 4-6, as disclosed in U.S. Patent 4,721,580, issued January 26, 1988 to Gosselink.

[0168] Anti-resoiling polymers useful in the present invention also include cellulosic derivatives such as hydroxyether cellulosic polymers, co-polymeric blocks of ethylene terephthalate or propylene terephthalate with polyethylene oxide or polypropylene oxide terephthalate, and the like. Such anti-resoiling polymers are commercially available and include hydroxyethers of cellulose such as METHOCEL® (Dow). Cellulosic anti-resoiling polymers for use herein also include those selected from the group consisting of C₁-C₄ alkyl and C₄ hydroxyalkyl cellulose; see U.S. Patent 4,000,093, issued December 28, 1976 to Nicol, et al.

[0169] Anti-resoiling polymers characterized by poly(vinyl ester) hydrophobe segments include graft co-polymers of poly(vinyl ester), e.g., C₁-C₆ vinyl esters, preferably poly(vinyl acetate) grafted onto polyalkylene oxide backbones, such as polyethylene oxide backbones. See European Patent Application 0 219 048, published April 22, 1987 by Kud, et al. Commercially available anti-resoiling polymers of this kind include the SOKALAN® type of material, e.g., SOKALAN HP-22®, available from BASF.

[0170] One type of preferred anti-resoiling polymers is a co-polymer having random blocks of ethylene terephthalate and polyethylene oxide (PEO) terephthalate. The molecular weight of this anti-resoiling polymers is in the range of from about 25,000 to about 55,000. See U.S. Patent 3,959,230 to Hays, issued May 25, 1976 and U.S. Patent 3,893,929 to Basadur issued July 8, 1975.

[0171] Another preferred anti-resoiling polymers is a polyester with repeat units of ethylene terephthalate units which contains 10-15% by weight of ethylene terephthalate units together with 90-80% by weight of polyoxyethylene terephthalate units, derived from a polyoxyethylene glycol of average molecular weight 300-5,000. Examples of this polymer include the commercially available material ZELCON 5126® (from Dupont) and MILEASE T® (from ICI). See also U.S. Patent 4,702,857, issued October 27, 1987 to Gosselink.

[0172] Another preferred anti-resoiling polymers agent is a sulfonated product of a substantially linear ester

oligomer comprised of an oligomeric ester backbone of terephthaloyl and oxyalkyleneoxy repeat units and terminal moieties covalently attached to the backbone. These anti-resoiling polymers are fully described in U.S. Patent 4,968, 451, issued November 6, 1990 to J.J. Scheibel and E.P. Gosselink. Other suitable anti-resoiling polymers include the terephthalate polyesters of U.S. Patent 4,711,730, issued December 8, 1987 to Gosselink et al, the anionic end-capped oligomeric esters of U.S. Patent 4,721,580, issued January 26, 1988 to Gosselink, and the block polyester oligomeric compounds of U.S. Patent 4,702,857, issued October 27, 1987 to Gosselink.

[0173] Preferred anti-resoiling polymers also include the soil release agents of U.S. Patent 4,877,896, issued October 31, 1989 to Maldonado et al, which discloses anionic, especially sulfoaroyl, end-capped terephthalate esters.

[0174] Still another preferred anti-resoiling agent is an oligomer with repeat units of terephthaloyl units, sulfoisoterephthaloyl units, oxyethyleneoxy and oxy-1,2-propylene units. The repeat units form the backbone of the oligomer and are preferably terminated with modified isethionate end-caps. A particularly preferred anti-resoiling agent of this type comprises about one sulfoisophthaloyl unit, 5 terephthaloyl units, oxyethyleneoxy and oxy-1,2-propyleneoxy units in a ratio of from about 1.7 to about 1.8, and two end-cap units of sodium 2-(2-hydroxyethoxy)-ethanesulfonate. Said anti-resoiling agent also comprises from about 0.5% to about 20%, by weight of the oligomer, of a crystalline-reducing stabilizer, preferably selected from the group consisting of xylene sulfonate, cumene sulfonate, toluene sulfonate, and mixtures thereof. See U.S. Pat. No. 5,415,807, issued May 16, 1995, to Gosselink et al.

[0175] The liquid compositions may comprise from 0.01% to 10%, preferably from 0.01% to 5%, and more preferably from 0.05% to 2% by weight of the total composition of a further anti-resoiling agent.

[0176] A preferred anti-resoiling agent is an anti-resoiling polymer. A more preferred anti-resoiling agent is a poly (vinyl methyl ether / maleic acid) copolymer, a soil suspending polyamine polymer, a poly vinyl pyridine-N-oxide polymer or a mixture thereof. An even more preferred anti-resoiling agent is a poly (vinyl methyl ether / maleic acid) copolymer, an alkoxyated polyamine polymer, a poly vinyl pyridine-N-oxide polymer or a mixture thereof. The most preferred anti-resoiling agent useful in the compositions herein are selected from the group consisting of : a poly (vinyl methyl ether / maleic acid) copolymer; an ethoxylated polyethylene amine according to the formula as described above wherein $n=2$ and $y=20$; an ethoxylated polyethylene amine according to the formula as described herein wherein $n=40$ and $y=7$; a poly vinyl pyridine-N-oxide polymer; and mixtures thereof.

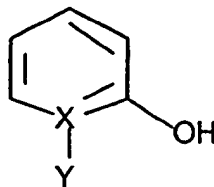
Other optional ingredients

[0177] The compositions herein may further comprise conventional carpet treating ingredients. Preferably, the compositions herein may further comprise a number of additional compounds such as stabilising agents, chelating agents, builder systems, radical scavengers, perfumes, dyes, suds suppressing agents, enzymes, photobleaching agents, bleach activators and other minors.

Stabilizing agents

[0178] The compositions of the present invention may further comprise a stabilizing agent selected from the group consisting of hydroxy pyridine N-oxides or derivatives thereof and mixtures thereof.

[0179] Suitable hydroxy pyridine N-oxides or derivatives thereof are according to the following formula:



wherein X is nitrogen, Y is one of the following groups oxygen, -CHO, -OH, $-(CH_2)_n-COOH$, wherein n is an integer of from 0 to 20, preferably of from 0 to 10 and more preferably is 0, and wherein Y is preferably oxygen. Accordingly particularly preferred hydroxy pyridine N-oxides or derivatives thereof to be used herein is 2-hydroxy pyridine N-oxide.

[0180] Hydroxy pyridine N-oxides or derivatives thereof may be commercially available from Sigma.

[0181] Typically, the compositions herein may comprise up to 2%, preferably from 0.001% to 1% and more preferably from 0.001% to 0.5% by weight of the total composition of a hydroxy pyridine N-oxide or derivatives thereof or mixtures thereof.

Chelating agents

[0182] The compositions of the present invention may further comprise a chelating agent.

[0183] Suitable chelating agents are those known to those skilled in the art. Particularly suitable chelating agents include for examples phosphonate chelating agents, polyfunctionally-substituted aromatic chelating agents, amino carboxylate chelating agents, other chelating agents like ethylene diamine N,N'-disuccinic acid and mixtures thereof.

[0184] Typically, the compositions herein may comprise up to 4%, preferably from 0.001% to 1%, and more preferably from 0.001% to 0.5% by weight of the total composition of a chelating agent.

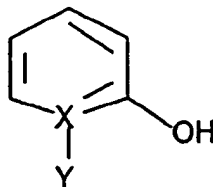
[0185] Suitable phosphonate chelating agents to be used herein may include ethydrionic acid, alkali metal ethane 1-hydroxy diphosphonates as well as amino phosphonate compounds, including amino alkylene poly (alkylene phosphonate), alkali metal ethane 1-hydroxy diphosphonates, nitrilo trimethylene phosphonates, ethylene diamine tetra methylene phosphonates, and diethylene triamine penta methylene phosphonates. The phosphonate compounds may be present either in their acid form or as salts of different cations on some or all of their acid functionalities. Preferred phosphonate chelating agents to be used herein are diethylene triamine penta methylene phosphonates (DETPMP). Such phosphonate chelating agents are commercially available from Monsanto under the trade name DEQUEST®.

[0186] Polyfunctionally-substituted aromatic chelating agents may also be useful in the compositions herein. See U.S. patent 3,812,044, issued May 21, 1974, to Connor et al. Preferred compounds of this type in acid form are dihydroxydisulfobenzenes such as 1,2-dihydroxy -3,5-disulfobenzene.

[0187] A preferred biodegradable chelating agent for use herein is ethylene diamine N,N'- disuccinic acid, or alkali metal, or alkaline earth, ammonium or substituted ammonium salts thereof or mixtures thereof. Ethylenediamine N,N'- disuccinic acids, especially the (S,S) isomer, have been extensively described in US patent 4, 704, 233, November 3, 1987, to Hartman and Perkins. Ethylenediamine N,N'- disuccinic acid is, for instance, commercially available under the tradename ssEDDS® from Palmer Research Laboratories.

[0188] Suitable amino carboxylate chelating agents to be used herein include ethylene diamine tetra acetates, diethylene triamine pentaacetates, diethylene triamine pentaacetate (DTPA), N-hydroxyethylethylenediamine triacetates, nitrilotriacetates, ethylenediamine tetrapropionates, triethylenetetraaminehexaacetates, ethanoldiglycines, propylene diamine tetracetic acid (PDTA) and methyl glycine di-acetic acid (MGDA), both in their acid form, or in their alkali metal, ammonium, and substituted ammonium salt forms. A particularly suitable amino carboxylate to be used herein is diethylene triamine penta acetic acid (DTPA).

[0189] Other suitable chelating agents to be used herein include salicylic acid or derivatives thereof, or mixtures thereof according to the following formula:



wherein X is carbon, Y is one of the following groups -CHO, -OH, -(CH₂)_n-COOH, and preferably is -(CH₂)_n-COOH, and wherein n is an integer of from 0 to 20, preferably of from 0 to 10 and more preferably is 0. Salicylic acid and derivatives thereof may be used herein either in their acid form or in their salts form as for example sodium salts.

[0190] Salicylic acid is particularly preferred herein and may be commercially available from Rhone Poulenc.

Bleach activators

[0191] In an embodiment of the present invention where the compositions herein comprise a peroxygen bleach, preferably hydrogen peroxide, said compositions may further comprise a bleach activator, as an optional ingredient.

[0192] By "bleach activator", it is meant herein a compound which reacts with the peroxygen bleach, preferably hydrogen peroxide, to form a peracid. The peracid thus formed constitutes the activated bleach.

[0193] Suitable bleach activators to be used herein include those belonging to the class of esters, amides, imides, or anhydrides. Examples of suitable compounds of this type are disclosed in British Patent GB 1 586 769 and GB 2 143 231 and a method for their formation into a prilled form is described in European Published Patent Application EP-A-62 523. Suitable examples of such compounds to be used herein are tetracetyl ethylene diamine (TAED), sodium 3,5,5 trimethyl hexanoyloxybenzene sulphonate, diperoxy dodecanoic acid as described for instance in US 4 818 425 and nonylamide of peroxyadipic acid as described for instance in US 4 259 201 and n-nonanoyloxybenzenesulphonate (NOBS). Also suitable are N-acyl caprolactam selected from the group consisting of substituted or unsubstituted benzoyl caprolactam, octanoyl caprolactam, nonanoyl caprolactam, hexanoyl caprolactam,

decanoyl caprolactam, undecenoyl caprolactam, formyl caprolactam, acetyl caprolactam, propanoyl caprolactam, butanoyl caprolactam pentanoyl caprolactam or mixtures thereof. A particular family of bleach activators of interest was disclosed in EP 624 154, and particularly preferred in that family is acetyl triethyl citrate (ATC). Acetyl triethyl citrate has the advantage that it is environmentally friendly as it eventually degrades into citric acid and alcohol. Furthermore, acetyl triethyl citrate has a good hydrolytical stability in the composition upon storage

[0194] The compositions according to the present invention may comprise up to 30%, preferably from 1% to 20%, and more preferably from 2% to 10% by weight of the total composition of a bleach activator.

Builders

[0195] The compositions according to the present invention may further comprise a builder system. Any conventional builder system known in the art is suitable for use herein. Suitable builders for use herein include derivatives of succinic acid of the formula $R-CH(COOH)CH_2(COOH)$ wherein R is C_{10-20} alkyl or alkenyl, preferably C_{12-16} alkyl or alkenyl, or wherein R can be substituted with hydroxyl, sulphy sulphonyl or sulphone substituents. Specific examples include lauryl succinate, myristyl succinate, palmityl succinate, 2-dodeceny succinate, 2-tetradeceny succinate. Succinate builders are preferably used in the form of their water-soluble salts, including sodium, potassium, ammonium and alkanolammonium salts.

[0196] Other suitable builders are oxodisuccinates and mixtures of tartrate monosuccinic and tartrate disuccinic acid such as described in US 4,663,071.

[0197] Further suitable builders for use herein are fatty acid builders including saturated or unsaturated C_{10-16} fatty acids, as well as the corresponding soaps. Preferred saturated species have from 12 to 16 carbon atoms in the alkyl chain. The preferred unsaturated fatty acid is oleic acid.

[0198] The compositions herein may comprise up to 10%, preferably from 1% to 7% by weight of the total composition of a builder system.

Radical scavengers:

[0199] The compositions herein may comprise a radical scavenger as another optional ingredient. Suitable radical scavengers for use herein include the well-known substituted mono and di hydroxy benzenes and derivatives thereof, alkyl- and aryl carboxylates and mixtures thereof. Preferred radical scavengers for use herein include trimethoxy benzoic acid (TMBA), di-tert-butyl hydroxy toluene (BHT), p-hydroxy-toluene, hydroquinone (HQ), di-tert-butyl hydroquinone (DTBHQ), mono-tert-butyl hydroquinone (MTBHQ), tert-butyl-hydroxy anysole (BHA), p-hydroxy-ansol, benzoic acid, 2,5-dihydroxy benzoic acid, 2,5-dihydroxyterephthalic acid, toluic acid, catechol, t-butyl catechol, 4-allyl-catechol, 4-acetyl catechol, 2-methoxy-phenol, 2-ethoxy-phenol, 2-methoxy-4-(2-propenyl)phenol, 3,4-dihydroxy benzaldehyde, 2,3-dihydroxy benzaldehyde, benzylamine, 1,1,3-tris(2-methyl-4-hydroxy-5-t-butylphenyl) butane, tert-butylhydroxy-aniline, p-hydroxy aniline as well as n-propyl-gallate. Highly preferred for use herein is di-tert-butyl hydroxy toluene, which is for example commercially available from SHELL under the trade name IONOL CP® and/or tert-butyl-hydroxy anysole and/or propyl gallate. These radical scavengers further contribute to the stability of the compositions herein.

[0200] Typically, the compositions according to the present invention may comprise up to 5%, preferably from 0.002% to 1.5% by weight and more preferably from 0.002% to 0.5% by weight of the total composition of a radical scavenger.

Examples

[0201] The following examples will further illustrate the present invention. The compositions are made by combining the listed ingredients in the listed proportions (weight % unless otherwise specified). The following Examples are meant to exemplify compositions used in a process according to the present invention but are not necessarily used to limit or otherwise define the scope of the present invention.

Compositions (weight %)	I	II	III	IV	V	VI
Hydrogen peroxide	2.0	4.0	5.0	6.0	—	—
Tinopal CBS-X®	1.0	0.1	—	0.001	0.005	0.002
Tinopal PLC®	—	—	0.5	—	—	0.001
Water and minors up to pH	Balance 4	Balance 6.5	Balance 5	Balance 4	Balance 6	Balance 5

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	Compositions (w ight %)	VII	VIII	IX	X	XI	XII
	Hydrogen peroxide	2.0	4.0	—	6.0	4.0	4.0
	Tinopal CBS-X®	0.01	—	—	0.1	0.004	0.0005
5	Tinopal PLC®	—	0.005	0.002	—	0.004	—
	PVNO	0.5	0.4	0.2	0.5	1.0	2.0
	PVPVI	—	—	—	0.5	—	—
	PV/AA	—	—	0.3	—	—	—
10	PVP	—	—	—	—	0.1	—
	Ethanol	3.0	2.0	1.0	3.0	3.0	3.0
	PnB	—	1.0	0.5	—	—	—
	PA	—	0.1	0.2	0.1	—	0.1
15	Diocetyl sodium sulphosuccinate	1.0	—	0.3	—	2.5	5.0
	Disodium lauryl sulphosuccinate	—	2.5	0.7	—	0.5	—
20	Disodium laureth sulphosuccinate	—	—	1.0	3.0	—	—
	Disodium lauramido MEA sulphosuccinate	0.5	—	—	—	—	—
25	Sodium lauryl sulfate	—	0.5	—	—	—	—
	BHT	0.01	0.01	0.02	0.01	—	0.01
	AMCP P	—	—	—	—	0.5	—
	Chelant*â	0.2	0.2	0.2	0.2	0.3	0.3
30	Na CnAS	—	—	—	3.0	0.5	—
	Salicylic Acid	0.5	0.5	0.5	0.5	—	0.5
	Propyl Gallate	—	—	—	—	1.0	—
	NaOH	0.16	0.16	0.16	0.16	0.06	0.26
35	Water and minors up to pH	Balance 4	Balance 6	Balance 8	Balance 6	Balance 3.5	Balance 4

PVP is Poly Vinyl Pyrrolidone

PVNO is Poly(4-Vinylpyridine-N-Oxide) (Mw 20,000) commercially available from Reilly.

PV/AA is N-vinylpyrrolidone and Acrylic Acid copolymer commercially available under the trade name Sokalan® PG 310.

PVPVI is N-vinylpyrrolidone and N-vinylimidazole co-polymer commercially available under the trade name Sokalan® PG55.

Sarcosinate is Sodium N-Lauroyl Sarcosinate commercially available from

Croda under the commercial name of Crodasinic® LS 30.

Diocetyl sodium sulphosuccinate is commercially available from Cytec under the trade name Aerosol OT®.

Disodium lauryl sulphosuccinat is commercially available from Witco under the trade name Rewopol SBF12®.

Disodium lauramido MEA sulphosuccinate is available from Witco under the trade name Rewopol SBC212P®.

PnB is propylene glycol n-butyl ether commercially available from Arco under the trade name Arcosolv® PNB.

BHT is butylated hydroxy toluene.

AMCP is acrylic/maleic based copolymers commercially available under the trade name Sokalan CP5®.

Chelant "a" is a phosphonate chelant available under the trade name DEQUEST®

Na CnAS is sodium alkyl sulphate.

PA is an ethoxylated tetraethylenepentamine, average molecular weight 12,000.

Tinopal CBS-X® and Tinopal PLC® are brighteners commercially available from Ciba Specialty Chemical.

[0202] The compositions exemplified above are preferably packaged in a container adapted to deliver a spray of droplets having a particle size distribution with a mean diameter $D(v,0.9)$ of 200 to 400 microns, when measured with Malvern Mastersizer S LongBed ® referenced herein before. A suitable container used was an electrically driven sprayer.

[0203] The compositions in the examples above deliver excellent soil hiding performance as well as excellent cleaning performance on particulate soil, greasy/oily soil, and/or proteinic soil as well as on other types of soils.

Claims

1. A process of treating a carpet comprising the application of a liquid composition onto said carpet using a manually or electrically operated spraying device wherein said composition comprises a brightener, with the proviso that said spraying device is not a pressurized device.
2. A process of treating a carpet according to claim 1, wherein said composition is applied onto said carpet using an electrically operated spraying device.
3. A process of treating a carpet according to any of the preceding claims wherein said brightener is selected from the group consisting of hydrophobic brighteners, hydrophilic brighteners and mixtures thereof.
4. A process of treating a carpet according to any of the preceding claims wherein said composition comprises from 0.001% to 10% by weight of the total composition of said brightener.
5. A process of treating a carpet according to any of the preceding claims wherein said composition further comprises a peroxygen bleach.
6. A process of treating a carpet according to claim 5 wherein said composition comprises from 0.01% to 20% by weight of the total composition of said peroxygen bleach.
7. A process of treating a carpet according to any of claims 5 and 6 wherein said peroxygen bleach is selected from the group consisting of : hydrogen peroxide; water soluble sources of hydrogen peroxide; organic or inorganic peracids; hydroperoxides; and diacyl peroxides; and mixtures thereof.
8. A process of treating a carpet according to any of the preceding claims wherein said composition further comprises a volatile organic compound.
9. A process of treating a carpet according to claim 8 wherein said volatile organic compound is selected from the group consisting of : an aliphatic and/or aromatic alcohol; a glycol ethers and/or a derivative thereof; a polyol; and a mixture thereof.

10. A process of treating a carpet according to any of the preceding claims wherein said composition further comprises an acid, a base or a mixture thereof.

5 11. A process of treating a carpet according to any of the preceding claims wherein said composition further comprises a surfactant selected from the group consisting of : a sulfosuccinate surfactant; sulfosuccinamate surfactant; sulfosuccinamide surfactant; carboxylate surfactant; sarcosinate surfactant; alkyl sulfate surfactant; alkyl sulphonate surfactant; alkyl glycerol sulfate surfactant; alkyl glycerol sulphonate surfactant; and a zwitterionic betaine surfactant; and mixtures thereof.

10 12. The use of a brightener in a carpet treatment composition to treat carpets whereby said carpet treatment composition provides soil hiding benefits and/or carpet cleaning benefits.

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EUROPEAN SEARCH REPORT

Application Number
EP 00 87 0006

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